



April 15, 2005

TO: Regional Project Development Engineers, and
Regional Hydraulic Engineers

FROM: Matthew J. Witecki, State Hydraulic Engineer

SUBJECT: Summary Update for March 2005 Hydraulic Manual

Major changes to the March 2005 Hydraulic Manual rewrite are listed below by chapters. It should be noted that all the equations in the manual were retyped and equation numbers added. Presently the Hydraulics Manual is only available online at <http://www.wsdot.wa.gov/FASC/EngineeringPublications/library.htm>. In the fall of 2005, hard copies of the manual will be distributed.

Chapter 1- Policy

Completely rewritten to clarify role and expectation of Designers, Regions, HQ, outside Agencies, and Consultants as well as:

- Defines Type A and B reports as well as Hydraulic Summaries.
- Clarifies the difference between a Hydraulic Report supplements verses a revision.
- Time line for review and archiving.
- The MRI for laterals was changed from 10 MRI to 25 MRI.
- Added a Conversion Table, Environmental Checklist and a Hydraulic Report Outline.
- Information was added regarding taking inventory of outfalls.

Chapter 2 - Hydrology

Added new hydrology information on stormwater design as well as:

- Guidelines for addressing snowmelt and cold climates.
- Continuous Simulation and Regional Storms hydrology methods.
- Clearer guidelines for selecting a hydrology method.
- NFF software information and weblinks for Isopluvials.
- Updated Stream gauge data and USGS Regression Equations.

Chapter 3 - Culvert Design

Re-organize the chapter as well as:

- Provides clearer guidelines on culvert design and analysis.
- Better guidelines for culvert outlet sizing including figures for clarification.
- Information on 3-sided structures.
- Updated HY8 information.
- The following correction should be noted to equation 4-1: $HW = H + h_o - LS_o$.

Chapter 4 – Open Channel Flow

Added new section for Downstream Analysis as well as:

- A section on weirs for irrigation use.
- The Riprap section was re-organized to provide better guidance for applicable use.
- Added ditch design guidelines.
- Better riprap and energy dissipation design guidelines.
- Added information on Bridges including Backwater Analysis and Scour.
- Some Mannings n values were updated per FHWA.

Chapter 5 – Drainage of Highway Pavements

Chapter was completely re-organized to be user-friendlier as well as:

- Updated Inlet information adding figures of various inlets.
- Revised the examples to more accurately reflect the work sheets.
- Introduces sag analysis work sheet and provides examples.
- Added guidelines to the Gutter Flow Section.
- More guidelines for hydroplaning and hydrodynamic drag (including spread).

Chapter 6 – Storm Drains

Clarification on clearance issue for storm sewer pipes as well as:

- Provides additional guidance for structures including: confined space, spacing and recommended use.
- Updated the drywell section to reflect HRM.
- Update Stormshed information on software for storm sewer design.
- Provides clearer definition of an outfall.

Chapter 7 – Fish Passage

The chapter was truncated and provides a brief summary of the WDFW guidelines. Designers are referred to WDFW guidelines for fish passage design for further guidance.

Chapter 8 – Pipe Material

Chapter was updated to reflect current treatments and new technology methods.

Chapter 9 – Highway Rest Areas

Chapter has been deleted; designers need to contact HQ Hydraulics.

If you have any questions or comments regarding this memo, please feel free to contact Rocio (Rose) Peralta at (360) 705-7260 or Aimee Navickis-Brasch at (509) 324-6139.